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Re-visualizing Cyberspace: Using Quasi Objects for Spatial Definitions

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ABSTRACT

The definition and visualization of cyberspace are an ambiguity. The creator of cyberspace defined cyberspace properties as being a space and a non-space and to appear as a 'consensual hallucination'. Most understandings of the Cyberspace tend to begin with a particular physical space centrist viewpoint that applies physical space models and expectations of one space to another (physical space to Cyberspace), with assumptions that presuppose the existence of a universal definition and agreement on the Physical space. This paper contests such a view and the traditional philosophical definition of subject-object space by exploring the potential of Latour's (1991) quasi objects to provide a different spatial definition. Cyberspace is hypothesized to be a collection of quasi objects, and to have the properties of both a Network and an Actor within the confines of the Actor Network Theory. The purpose of this paper is to propose contradictions to current assumptions and to ignite a debate regarding possible multiple solutions to current dilemmas in the definition of cyberspace.

Keywords Cyberspace, Quasi objects, Spatial Dilemmas, Zeitgeist, Physical Space

INTRODUCTION

The term Cyberspace is often taken for granted in conversations people have regarding the use of information technology, the Internet and global communication webs. Closer scrutiny of term usage discloses ambiguity of use and apparent slippage in semantics. The meaning one person takes from the term may not be the same, similar or related to another. In this paper the challenge of defining the term is taken up and the various philosophical positions in which it is given meanings explored. No attempt is made to be definitive but rather the basis for an ongoing and evolving debate is established.

The key target for the investigation is assumptions, theories and philosophical positions that obscure the debate of ontology. For example freedom is sought from dialectical arguments that debate the nature of Cyberspace without specifying the preferred ontology or asking questions of the ontology. A summative model is presented from meta level reflections that have explored alternative perspectives. This model based on the creation of the four pole evaluative framework identified in Figure 4 allows for the inclusion of the ontology by examining it within the context of quasi objects in an Actor Network Theory universe. The model also helps to visualize the promulgation of moral and legislative frameworks onto Cyberspace. The visualization ensures that while the inheritance of the attributes between the spaces has not achieved a critical point, the focus of the debate remains on the attribute migration and refinement that happens between the spaces.

The definition and visualization of Cyberspace are presented in the paper to depict how the technical act of defining a space depends upon its visualization, and vice versa. The paper is structured to explore in the first section the dilemmas of defining the term Cyberspace and then to look at philosophical approaches to modelling and defining the phenomena. In the second section, the concept of physical space and the technologist's Cartesian definition of space are discussed. Further modelling systems are elaborated including an innovative approach using quasi objects. In section 3, the key concept of inheritance between spaces is introduced. Inheritance is used to observe and to explain various possibilities for the transfer of attributes and properties from one philosophical spatial construct to another. The section concludes with a vortex model that is informed by Actor Network Theory and the physical space Zeitgeist. The paper then concludes with a short discussion of the problems addressed by the proposal and other alternative interpretations of possible solutions.

CYBERSPACE DEFINITIONS

Definitions of Cyberspace are mult-various and represent experience, visualization, and well-meaning attempts to communicate phenomena. Strate (1999) argues that the neologism Cyberspace is ill-defined and is polysemic because "cyberspace is everywhere, and through widening usage, threatens to become everything, the term has become increasingly more vague and drained of meaning" (Strate, 1999, p. 17). The advocated solution is to launch an investigation and to report observations on three levels of complexity. The complexities are the

ontological, the fundamental objects of Cyberspace and a critically reflective synthesis of observations. A related application of the advocated solution at the first level is to compare cyberspace to what it is not. This includes the physical world or physical space. The process is in keeping with traditional philosophy which tends to regard space as a dichotomy between absolutism and relationalism (Teller, 1991).

There are two distinct dialectic positions academics take regarding the nature of Cyberspace. One position argues space is dead, and the other advocates realism and mapping to the real world. The position that space and time have been annihilated due to Cyberspace making it a spaceless and placeless social space of interaction (Cai et al., 1999) denies a real connection. *"Cyberspace is profoundly anti-spatial – the Internet is ambient... nowhere in particular but everywhere at once."* (Mitchell, 1995). The other argument refers to the continuing importance of real world spatial and geographical considerations having an impact on creating and sustaining the Cyberspace. Distance is not dead, but merely appears to be in a space seemingly comprised only of information, albeit elusive to grasp and define (Floridi, 2005).

A synthesis of these two positions comes in the form of a compromise wherein it is argued that the most primitive layers of the Open Systems Interconnection (OSI) reference model (the physical and network layers) are geographically bound and as such space and time dependent; whereas the top most layers (presentation and application layers) are spatially-agnostic and thus non-dependent on space and time on their own. There are also academics who have suggested that the notion of Cyberspace is mostly illusory and contest the existence on the grounds of a paradox of space and non-space simultaneously (Lee et al., 2002, Bukatman, 1993, Delaney, 1988). The term Cyberspace invented by its creator was termed '*consensual hallucination*' in a '*non-space*' (Gibson, 1984) in a form much like the term Utopia refers to an imaginary place. In this way virtual reality is given a fabric of reality (Deutsch, 1997). Einstein promoted space as more of a social construct than an objective reality (Einstein, 1962) as against Kant's a priori premise (Kant, 1998). Cyberspace depends on a perceiving mind for its existence. Defining a new age of web interaction where countless everyday activities can be done online. (Zajicek, 2007) provides a paradox with the emphasis on cloud computing within the Cyberspace. The distance is increased between an end-user and data in the physical space, and perceptual space is decreased when interacting with the Cyberspace.

Definitions of a Cyberspace tend to all have physical space centric language that assumes a traditional philosophic dualism between a subject and an object. The definitions are presented as syntheses that differ in degree between different poles of dialectic. The logical positions appear as a false dilemma and a construction that forecloses the solution. Questions of the nature and ontology of Cyberspace are ignored and assumptions left untested. The beliefs that human actions cause events in Cyberspace remain as embedded assumptions (such as typing an online article in Cyberspace on a computer or those tasks that have been automated between computers). The (contestable) assumption is that because the former (physical space) is space and time dependent, by necessity it causes the latter (Cyberspace) to be space-time dependent by degree as well. These two positions are the only legitimate points of departure in the case, and that there exists a definition of *physical space* that can be used to compare against a non-space such as Cyberspace. Baudrillard (1983) adds to this end:

"Disneyland is presented as imaginary in order to make us believe that the rest is real, when in fact all of Los Angeles and the America surrounding it are no longer real, but of the order of the hyperreal and of simulation." (Baudrillard, 1983, p 13)

The assumptions are challenged. It could be proposed that that by comparing Cyberspace to physical space (a universal phenomena) the question of 'what is Cyberspace as an ontological entity' is ignored. Highly abstracted and generalized definitions of Cyberspace also fail to acknowledge the plurality that exists with the *polysemic* phenomenon. The fluidity regarding the meaning of Cyberspace and its associated terms introduce semantic slippage to the point that ambiguity overrides sensibility. An example is Margaret Wertheim's equating the Cyberspace as a technological expression for spiritual desires for transcendence, and early Cyberspace users as ascetic monks leaving the temptations of flesh and desire to serve a higher goal (Wertheim, 1999). Such richness of imagery is far removed from a binary Cartesian worldview of Cyberspace accepted by technologist and yet abstracted beyond modeling (Strate, 1999). The position is reached where the job of the academics, philosophers, technologists and others trying to create a comprehensive definition of the Cyberspace as a formal system that can be adequately defined and legislated is difficult.

QUASI OBJECT SPACES

Latour (1991, p. 105) calls efforts to create definitions the works of purification, and the processes to allow interaction between defined objects works of translation. Purification occurs when extremities of poles or absolutes such as society and nature are separated creating incommensurability (within which lie quasi / objects)

and spatial proximities of distance between the absolutes. Works of purification are in line with Nietzsche's suggestion being only that which has no history can be defined (Nietzsche, 2004). By creating the incommensurability resultant of the defined poles, there is a need to bridge the gap. Translation is the process whereby mediatory actions occur in an infinite manner to bridge the space between the poles.

Latour's (1991) theory allows a natural bias on the part of humans to try to codify things in separate categories and then control the set of relationships from one to the other in a strict manner that can be governed using ethical or legalistic models, while allowing for some random interactions to take place between different poles. The question then arises if this theory can be applied to cyberspace and whether the Cyberspace can be codified into a greater formal system that is more sophisticated than the strictly Cartesian mathematical axiomatic formal system of the technologists. The system would allow the humans to design works of purification (categorizing and limiting functions for definition), and simultaneously allowing works of translations and mediation (wherein it is accepted and anticipated that some rules will never be enforceable).

The adoption of an anthropomorphizing perspective or by using human experience on physical space to make predictions is an innovation that can provide useful insights (Hofstadter, 1979). However, Latour's model for examining a human-nature collective (remaining within physical space at all times) introduces certain limitations. It does not suggest what poles need to be investigated, and this is made difficult by the fact that Cyberspace can signify different interpretations dependent on the stakeholder's viewpoint. If the relativity argument is accepted that there are no absolute poles, then only tentative progress can be made in search for a formal model for the Cyberspace upon which moral and legal frameworks can be situated.

Latour's discussion of the presence of quasi or hybrid objects is an innovation that provides a useful insight into possible ways of exploring spatial definitions. The conjecture is that when human-nature collectives proliferate with distinct and incommensurable poles, such as nature and human, come into interaction in ways that were not originally devised and catered for, such proliferation creates quasi objects. Applying the concept of quasi objects while attempting to codify and formalize the Cyberspace remains difficult, due to sheer numbers and difficulty of describing. However, these quasi objects appear useful in the exploration of solutions for definition and visualization of Cyberspace. Current definitions of Cyberspace are built on a multitude of material and semiotic relationships within both the Cyberspace and the physical space. A potential infinite number of stakeholders and infinite number of technologies may collaborate in infinite ways forming transient relations (or quasi objects in Latour's terms) between Cyberspace and physical space. These relationships vary in degrees of permanence to create Cyberspace the Network; a network that appears to function within the confines of the classic Actor Network Theory (abbreviated as ANT from this point on) model utilizing the agency of many actants, human and otherwise for its continued existence and evolution. In this sense, the Cyberspace comprises of both an Actor as well as a Network. It has an Actor that is more than the sum of the parts that define its Network, in that it acts as an agency that helps create an independent space formed on information flow (Floridi, 2005), and a Network that is made of physical infrastructure.

Plausible cyberspace models

Cyberspace the Network is built atop the physical infrastructure also called the Internetwork (Leiner et al., 1997). This internetwork has been reliant on a mathematical axiomatic core structure underpinning its foundations. These original foundations were designed by technologists in consultation with other stakeholders, and were based on specific business or defense requirements that were translated into the world of bits and bytes (Gavras et al., 2007). Even though the Internet infrastructure has since evolved, its core axioms and the initial founding philosophy based on the scientific biases have remained unchanged (Cairano-Gilfedder and Clegg, 2005).

The following figure 1 illustrates how technologists conceived the initial Cyberspace and Physical space interactions.

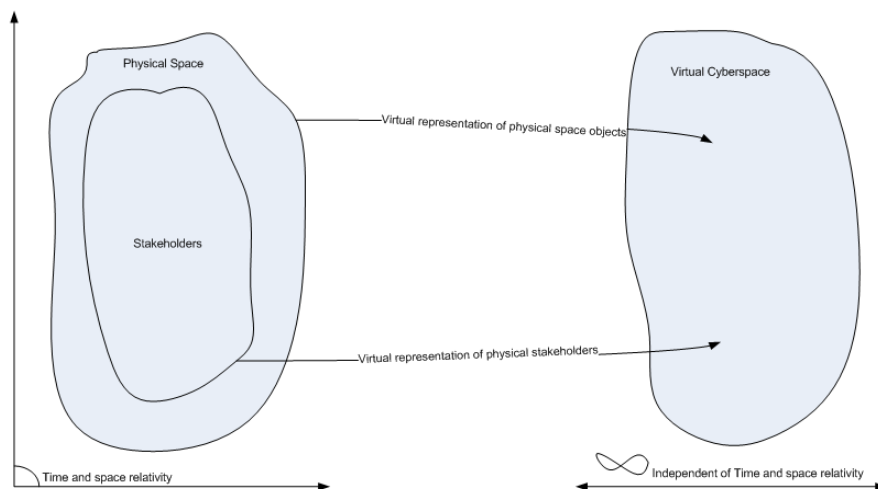


Figure 1. Cyberspace and Physical Space Interaction (Gavras et al., 2007, p 14)

The initial ontology of the Cyberspace the Network was based on a simple Cartesian plane that established another Space formed out of technology, subservient in inheriting attributes, assets and issues from the Physical Space (Clark et al., 2005). It assumed that Cyberspace and Physical space existed as two distinct entities that shared certain attributes and stakeholders (Floridi, 1999).

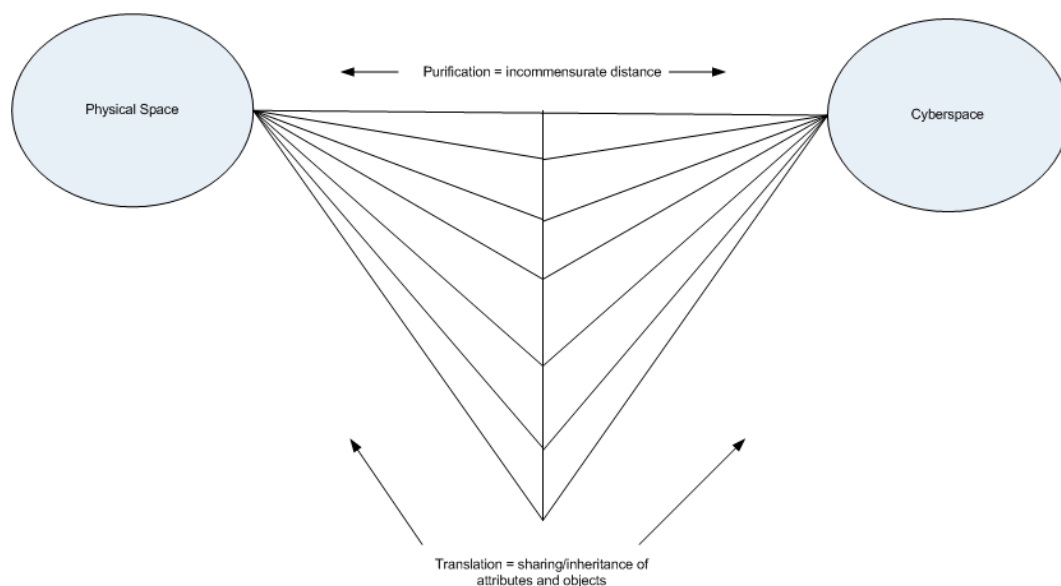


Figure 2. Latour's Model Modified for Physical Space and Cyberspace (author, 2008)

The two spaces could be likened to two poles within a plane that exhibit a series of interactions. Latour (1991) has taken similar poles, nature and human in his work, and built evaluative models for the purposes of investigating the nature of the relationships that happen between the two poles. Such a model also allowed him to question the premises surrounding the relativity versus absoluteness debate that surrounds these poles. Latour's model with appropriate editions can be utilized to envision this initial separation of the Physical space and Cyberspace. By replacing Nature with Physical Space and Humans with Cyberspace in his original bi-polar model, two distinct poles can be obtained, wherein using works of purification they are treated as different entities and are kept in different categories. Though they are regarded in essentially their own domains, they carry out interactions that cannot always be clearly defined falling under the purviews of translations and

mediations. A revised and innovative model with the two poles being the Cyberspace and Physical space is presented in Figure 2. Figure 2 shows both the inherent distance between the two spaces as well as the works of translations that happen between the spaces. It also reflects the presence of quasi objects that proliferate somewhere between the two presumed absolute poles. Latour's model of nature-human collective relies on a concept of space dependent on an inherent distance that does not apply in the Cyberspace, as distance appears

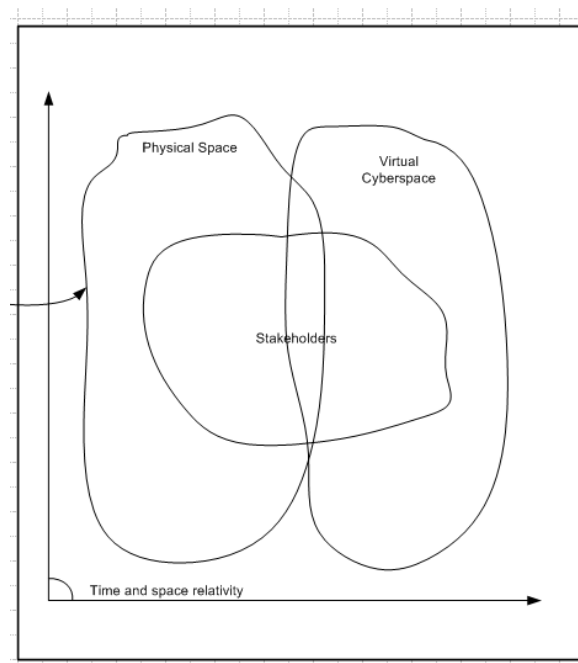


Figure 3. The Mechanics of Physical Space and Cyberspace Interactions

dead (even though it may be felt due to issues such as bandwidth, performativity, and so on) in the Physical space-Cyberspace scenario. Instead of the nature-human collective of Latour acting in awareness of the positioning of a quasi object on the spectrum, Figure 2 relationships appear to be more like quantum mechanics wherein it is almost impossible to draw a line between Physical space and Cyberspace. The distinction becomes difficult to describe when a stakeholder or a quasi object is more involved or responsible in the Cyberspace or the Physical Space when it/s/he resides in them both simultaneously as displayed in figure 3.

The nature of interactions carried out by stakeholder(s) in Figure 3, wherein they appear to be in both spaces at the same time, demonstrates the biggest problem that is encountered when Latour's original ethnologist model is utilized with simple swapping of poles for understanding the dynamics of Cyberspace-Physical Space relationship. The commensurability requirement does not exist. The bias that appears necessary in using artificial or natural purification to keep for instance branches of government separate at the expense of ignoring the works of mediation in the Physical Space does not seem to exist in the Cyberspace, due to the perceived non-existence of distance. This perception negates the need for the existence of purity or absoluteness between poles. Thus, a distinct shifting of biases is encountered in Latour's collectives. It was an artificial yet necessary purity based on incommensurability that was reconciled using works of mediation. However, in examining the Cyberspace and its relationship with the Physical space, the reverse holds true when it appears that to reconcile the works of mediation that happen as a default, an artificial purity is being imposed. In other words, chaos seems acceptable within the assumed formal and definable collectives in the Physical Space as a by-product of order, but on the Cyberspace the efforts seem to be geared towards introducing order as though it were a by-product of chaos.

The two poles discussed above being Physical Space and Cyberspace are themselves complex meta poles formed by an infinite amount of works of translations amidst works of purity within themselves. For instance, the *Zeitgeist* (Hegel, 2004) of the Physical space is a loose collection of an almost infinite number of participating smaller *Zeitgeists* representing prevailing cultural, political, ethical climate. The same principle applies on Physical Space the Network, the Cyberspace the Network and Cyberspace the Actor.

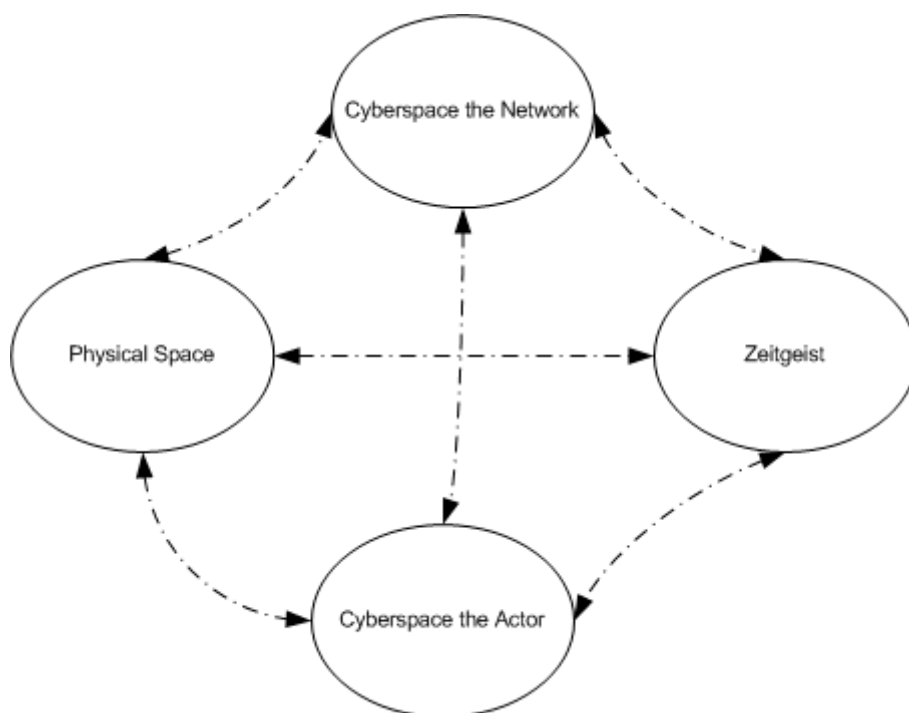


Figure 4. Entity Relationships of the Four-pole Model

Two observations or statements of tensions can be made at this point regarding the nature of relationship between Cyberspace and Physical space based on Figures 2 and 3.

- i- Cyberspace appears immanent in that it is dependent on Physical space(s) for its existence, and the latter is transcendent in that it governs the former
- ii- Cyberspace is transcendent as it does not depend on another space, and physical space is immanent due to its sociological constraints

The best way to explain these tensions would be to propose a theoretical model, wherein both spaces could act as transcendent and immanent at the same time, yet where the spaces themselves are allowed to appear indistinguishable from each other due to the interactions of their shared stakeholders. To progress in deriving such a theoretical model, it is necessary to acknowledge the presence and influence of two missing non-scientifically provable entities that the Actor Network Theory provides. Cyberspace the Actor and the Zeitgeist(s) of the Physical Space, entities are formed by their respective networks but take on a life of their own. Figure 4 can be drawn which shows the relationships between these four entities. The entities form the four poles that are necessary to draw up a theoretical model based on the interactions within the peculiar indistinguishable features as noted in figures 2 and 3.

A SPATIAL INHERITANCE MODEL

Stakeholders or quasi objects can exist in both the Cyberspace and physical spaces; however, the exact boundaries of the spaces may not always be distinguishable. This is the case when a quasi object appears to operate in multiple spaces at the same time. The number of stakeholders varies continuously. New stakeholders are born with the birth of a new space. For instance, Cyberspace has distinct stakeholders that do not have an explicit (however causal) relationship with the Physical space but take on an increasingly important role within Cyberspace. A researcher can be examined who functions in both the cyberspace and the physical spaces as she writes articles and consults data on the Cyberspace. Doing this he acts as the bridge between his attributes of writing in the physical space and writing in the Cyberspace. As she acts as the agency for change, he spans both the spaces linking two entities that have a dependence on her for existence. He acts in the same fashion when her poetic avatar gets a representation on the Cyberspace when she publishes a poem he wrote in the physical space on an Internet forum.

Not all attributes travel between the spaces that are dependent on an explicit animate stakeholder. Attributes such as justice, morals, and laws utilize agencies such as the Zeitgeist of the space (one of the many on the Physical space) which may be either represented as a quasi object according to Latour's model or may be explicitly

codified in works of purification in the form of laws. This migration of attributes can be termed an inheritance as the mother space role is taken by the physical space in both sustaining the Cyberspace and acting as the inheritor of attributes. Though the above noted examples refer to attribute migration happening from Physical Space to Cyberspace, the attributes may also be inherited from Cyberspace to physical space. However, this inheritance from Cyberspace to Physical space does not essentially reverse the phenomena.

There appears a genuine space-centrism in discussions regarding collectives and spaces, for example Clark et al. (2005) regarding tussles in the Cyberspace a direct result of problems in the Physical space, and other academics regarding the Cyberspace as a projection of Physical space (Katsh et al., 2005, Balkin and Noveck, 1996, Peristeras and Tarabanis, 2004, Peterson et al., 2000). As was noted above, Latour himself exhibits that bias once he forms his model of nature-space collectives on the basis of distance as a key attribute that exists in the physical space. Such a bias requires efforts to create a system that is as formal as possible for better human understanding and ease of use to create works of purification. Indeed, it could be argued that the very same bias is exposed when this article proposes that Cyberspace exists because of its depending upon the Physical space instead of arguing the counter point. It is equally plausible to claim the Physical space as an initial point of departure, if not in the strict Kantian or Newtonian sense, then at least exhibiting shades of Physical space-centrism.

The phenomena of space-centrism does not end with the Physical space claiming inheriting rights for a space that it has created, but the same event repeats when Cyberspace is used to make a formal system out of the Physical space it inherited its attributes from. In this second logic of inheritance, instead of the Cyberspace yielding to the space it exists within, it creates a new formal system, the physical space-within cyberspace-within physical space that is then the Cyberspace Actor's effort at promoting Cyberspace-centrism. As a model, a constant attribute refinement also takes place at every step of inheritance. For instance, the researcher's poetic and writing attributes have now been inherited into the Cyberspace wherein eventually all the myriad relationships he had in the physical space between these two and other stakeholders' attributes will be inherited by the Cyberspace. Once inherited in the Cyberspace they will be further multiplied in an almost infinite manner possible with each other and other stakeholders' attributes that could not be done within the Physical Space. Taking a macro view, this would translate into a shrinking of perceived space when the same phenomenon happens on an infinite number of actors and attributes inherited from individual Zeitgeists in the Cyberspace, giving rise to slogans such as Distance is (almost) Dead. In reality, the space has been refined as information of attributes and their interlinked relationships is refined in a more efficient fashion after inheritance.

Taking the researcher again as an illustration, it may be observed that inherited attributes, which are potentially infinite (Schaefer and College, 2007), by the Cyberspace are passed back to the Physical space. However, the returned physical space that is used by the Cyberspace is not the same the latter inherited from, as the source is not kept the destination by the space, but instead the Cyberspace creates another conceptual physical space that then is available to the researcher in a refined fashion. As this pattern continues, spaces within spaces continue to evolve with the by-product of refinements happening at every stage. This raises an important question. Is this abstract space progression potentially infinite or is there a theoretical 'nth' space wherein all possible attributes have been refined to the level that there is no further need for works of purification and works of translations? In other words, would there ever be a point wherein it would be safe to declare 'Distance is dead' akin to Nietzsche's similar declaration on God (Nietzsche, 2005).

Allowing that the number of stakeholders on any one space is infinite as well as the number of relationships that can be inherited, and considering the fact that no formal system can ever fully explain itself by sub-systemizing it (utilizing Gödel's incompleteness theorem (Hofstadter, 1979)), the answer to that question would appear to be that this refinement is by necessity infinite as well. However, it comes with the caveat that the distance between works of purification and translation keep on decreasing. Hence both Cyberspace and Physical Space are based on four poles, share stakeholders, are indistinguishable and allow for inheritance of attributes. The following diagram depicts this relationship in form of spaces-within-spaces which could also be likened to an infinite vortex. Figure 5 can also be likened to an ever-collapsing vortex that manages to draw hooks onto its layers as it shrinks. These hooks allow for attribute projections between the spaces utilizing the interplay between the four poles identified in figure 4.

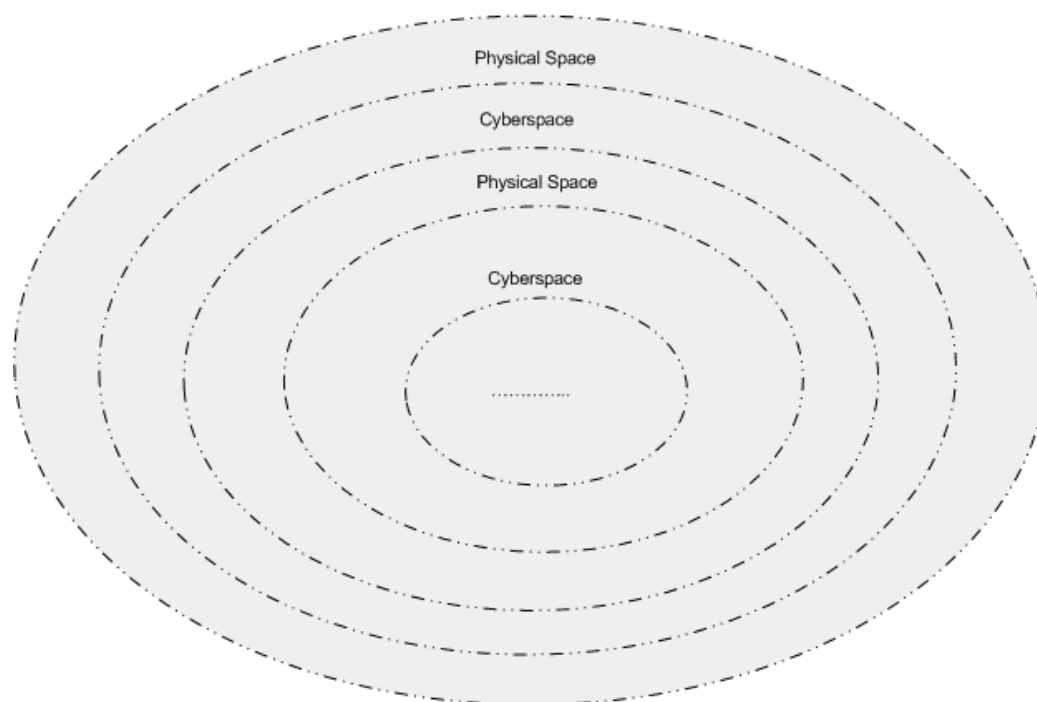


Figure 5. Spaces-within-spaces vortex from - to infinity loop

DISCUSSION

A model such as figure 5 introduces a partial solution to the problems found in current definition of cyberspace. An ontology for the Cyberspace is generated that does not require dialectical arguments for justification. The model in figure 4 based on the creation of the four pole evaluative framework allows for the consideration of the ontology by examining it within the context of quasi objects in an Actor Network Theory universe. The model also helps to visualize the promulgation of ethical and legislative frameworks onto Cyberspace when it is accepted that no firm frameworks in the spirit of Latour's works of purification can be situated at the top layers of physical space or Cyberspace without suitable and sufficient refinement. The visualization ensures that while the inheritance of the attributes between the spaces has not achieved a certain critical point, the focus of the debate remains on the attribute migration and refinement that happens between the spaces.

Similarly the model helps to explain why current efforts to control actions on the Cyberspace relating to digital media rights, general copyrights and software piracy, legal interpretations and legislations fail to take effect. It is because all such efforts are concentrated at the outermost layer of the model, and either assume the false premise of the Cyberspace as a space that ought to have similar if not exactly the same standards found on the physical space, or carry out these actions before a contingency has been established through the constant revision of attributes. The model also allows multiple definitions of both Cyberspace and Physical space to exist, taking into account an increased number of ambiguities persisting at the outermost layers of the Physical space and Cyberspace (Figure 5) as a cause for such ambiguity to be present. It allows for multiple collectives in the Physical Space each with their individual Zeitgeist and Networks, to mingle with each other and bequeath attributes to Cyberspace, wherein post refinement they are passed back onto the Physical space.

The model exposes the biases of Physical-space centrism. These criticisms disallows consideration of Cyberspace except as a projection of all entities in the Physical space. The dogma assumes that the data from a phenomenon is investigated with a pre-conceived perspective (Quine, 1951). By breaking this space centric dogma, the manner of dealing with Cyberspace is forced to consider the ontology of the space instead of regarding this as a mere shadow of the Physical space. It is conceded that the model accepts the physical space birthing the Cyberspace and the outermost layer in Figure 5. The preference however can be justified with the caveat that to understand a relative space such as Cyberspace, the space housing the perception regardless of its own relativity must take the investigative space role. As such, the outermost space in a future Physical Space – Cyberspace model may house Cyberspace or another, should the predominant perception lie within it.

CONCLUSION

The definition and visualization of Cyberspace have been discussed to emphasize the ambiguity of all definitions. The physical space centric positions have been accentuated in order to contrast alternative concepts of cyber spatial models. This has included a discussion of inheritance of spatial beliefs and an exploration of how quasi objects may or may not provide the basis for other spatial conceptions. Traditional philosophical space - time definitions have been contested. The advocacy for a particular entity based model has been advanced to further the debate. The ploy has been to suggest that this is a plausible alternative to current proposals for the definition and visualization of cyberspace. Perhaps concepts such as ethicality, morality and law may sit more comfortably within such a proposal.

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